



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,140	01/28/2004	Masao Miyamura	248212US2	9714
22850 7590 12/01/2008 OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER BAND, MICHAEL A	
			ART UNIT 1795	PAPER NUMBER
			NOTIFICATION DATE 12/01/2008	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No. 10/765,140	Applicant(s) MIYAMURA, MASAO	
	Examiner MICHAEL BAND	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 13, 14, 17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 13, 14, 17 and 18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/20/2008 has been entered.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-8 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rauschnabel et al (WO 99/63129), citations below from English language equivalent (US Patent No. 6,613,393), in view of Ichihara et al (US Patent No. 4,782,477) and Casey (US Patent No. 4,692,233).

With respect to claims 1, 3, 5, and 7, Rauschnabel et al discloses a sputtering method with a vacuum chamber (col. 5, lines 15-20), a cylindrical substrate holder (fig. 4, turntable [60]) (It is noted that an error in fig. 4 lists the turntable as part [50]. Col 7,

Art Unit: 1795

line 16 states that the turntable should be part [60]) with the substrate mounted on the outer periphery of a thin cylindrical surface (fig. 4, [41], [50]; fig. 5, [41], [50]). The vacuum chamber is divided into four compartments, with two (fig. 4, [47], [48]; col. 7, lines 12-15) having gas supplied to them (i.e. sputter deposition compartments).

Rauschnabel et al depicts fig. 5 as a section along line V-V through the apparatus according to fig. 4. Fig. 5 further illustrates two sets of cathodes and targets [52], [53] in separate compartments separated by a partition [54]. The partition can also be seen in fig. 5 separating the middle of the turntable [60]. Fig. 5 also shows two sets of gas inlets [44], [51] that can be seen entering each of the separate compartments to generate separate plasmas (col. 7, lines 15-23). Furthermore, Rauschnabel et al discusses coating times can be further reduced by operating the two deposition processes (i.e. cathode) simultaneously (col. 1, lines 65-67), thus the plasma generators that sputter the coating materials also operate simultaneously. Furthermore Rauschnabel et al discloses that greater separation between process gas atmospheres by pumping down the chamber between processes (col. 5, lines 9-14). In addition, Rauschnabel et al also states that the vacuum chamber is compartmentalized to manage fresh gas and exhaust gas flows leading to a superior separation of the processes by controlled adaptation to the desired stoichiometry (col. 5, lines 15-22). However Rauschnabel et al is limited in that while a cathode shutter is used (col. 5, lines 1-6), it is not suggested to have two that operate simultaneously. Rauschnabel et al is further limited in that while exhaust systems are discussed, it is not suggested as to the placement of said exhaust systems.

Ichihara et al teaches a sputtering apparatus for an optical (i.e. recording) layer comprising a substrate support [50] capable of rotation [52] with a sputtering supply gas [42], a sidewall exhaust system [44], targets [32L], [32R], and shutters [36L], [36R] (abstract; fig. 2). In addition, Ichihara et al teaches rotating the holder [50] with shutters [36] corresponding to a Tb-target and Co-target sputter sources [32] and simultaneously opening said shutters to form a Tb-Co film on each substrate (col. 6, lines 14-20). Ichihara et al also discusses that this process can be used with a sputtering apparatus as depicted or by a plasma polymerization apparatus (col. 10, lines 51-66).

It would have been obvious to one of ordinary skill in the art to use two shutters for the two cathode target for use in a sputtering apparatus or plasma polymerization apparatus as taught in Ichihara et al (col. 10, lines 62-66) to improve the sputter apparatus or plasma polymerization apparatus having single shutter cathode target in a Rauschnabel et al (col. 4, lines 66-67; col. 5, lines 1-8) for the predictable result of improving deposition control of the two cathode targets.

Furthermore it would have been obvious to one of ordinary skill in the art to use the location of the vacuum pump system of Ichihara et al for the disclosed vacuum port of Rauschnabel et al since Rauschnabel et al fails to specify a location. Because both references teach exhaust (i.e. vacuum) systems in similar devices, it would be obvious to substitute the particulars of one into the other to achieve the predictable result of evacuating the chamber. *KSR International Co v. Teleflex Inc.*, 550 U.S.--, 82 USPQ2d 1385 (2007).

However Rauschnabel et al is further limited in that it is not specifically suggested to have a separate exhaust port for each partitioned chamber.

Casey teaches a vacuum metallizer comprising a vacuum chamber [1] split into three sub-chambers via partitions [5]-[8], where each sub-chamber are individually pumped via vacuum pumps [30]-[32] (abstract; fig. 2). Casey cites the advantage of using individual vacuum pumps as restricting gas leakage between adjacent sub-chambers (abstract), thus leading to increased purity and control of deposition material for each sub-chamber. However Casey is limited in that it is not suggested to incorporate multiple vacuum pumps per sub-chamber. It has been held that mere duplication of parts has no patentable significance unless a new and unexpected result is produced. *In re Harza*, 274 F.2d 669, 124 USPQ 378 (CCPA 1960). Therefore it would have been obvious to one of ordinary skill in the art to place multiple vacuum pumps per sub-chamber for the predictable result of maintaining a vacuum, purity, and control of deposited material.

It further would have been obvious to one of ordinary skill in the art to use individual vacuum pumps per sub-chamber taught in Casey for the apparatus of Rauschnabel et al to gain the advantage of superior purity and control of deposition material.

With respect to claims 2 and 6, modified Rauschnabel et al further discloses that DC magnetron sputtering, pulsed magnetron sputtering, or double-cathode sputtering can be used (col. 3, lines 33-41).

With respect to claims 4 and 8, modified Rauschnabel et al further discloses a plasma generator using microwave discharge (col. 2, lines 43-48). Modified Rauschnabel et al also discloses that in addition to microwave plasma, bias voltages can also either be used in conjunction with the microwave plasma or solely by itself (col. 3, lines 11-16). Modified Rauschnabel et al further states that "high frequency bias voltages have proven particularly effective in this context (col. 3, lines 16-18).

With respect to claims 13 and 14, modified Rauschnabel et al further depicts in fig. 5 two distinct targets [53] with each target having reactive gas [51] and sputter gas [44] in proximity. In addition, modified Rauschnabel et al discusses using various metals and their oxides deposited via sputtering (col. 3, lines 60-67; col. 4, lines 1-8).

With respect to claims 17-18, Ichihara et al teaches a sputtering apparatus for an optical (i.e. recording) layer comprising a substrate support [50] capable of rotation [52] with a sputtering supply gas [42], a sidewall exhaust system [44], targets [32L], [32R], and shutters [36L], [36R] (abstract; fig. 2), with no partition present separating the targets (i.e. first and second film deposition areas) [32L], [32R] when both shutters [36L], [36R] are opened simultaneously (fig. 2).

Response to Arguments

3. Applicant's arguments filed 10/20/2008 have been fully considered but they are not persuasive.

4. On p. 7-8, the Applicant argues that Casey fails to teach a fifth and sixth exhaust ports between a first film deposition area and a second film deposition area.

The Examiner respectfully disagrees. Casey teaches in fig. 2 a first film deposition area [13] with a vacuum pump [32], a second film deposition area [11] with a vacuum pump [30], and an area [12] between said first and second film deposition areas [13], [11] with a vacuum pump [31]. Additionally, Casey also depicts in fig. 2 a vacuum pump [33] between the second film deposition area [11] and the first film deposition area [13]. While Casey is limited in not incorporating multiple vacuum pumps per sub-chamber, it would have been obvious to one of ordinary skill in the art to place multiple vacuum pumps per sub-chamber for the predictable result of maintaining a vacuum, purity, and control of deposited material.

5. On p. 8, the Applicant argues that the configuration of Casey does not allow for two exhaust (i.e. vacuum) ports to be located on different sidewalls.

While the Examiner agrees that Casey does not teach exhaust ports on different sidewalls, Casey is being used to teach a pump between deposition areas and to individually pump deposition areas, not to teach different sidewalls. Rauschnabel et al depicts in fig. 4 an apparatus having four distinct sidewalls. With the teaching of the vacuum (i.e. exhaust) pump configuration of Casey combined with the apparatus of Rauschnabel et al yields a four side-walled apparatus with vacuum pumps on different side walls between deposition areas [61], [62], with motivation for making this modification being to restrict gas leakage between adjacent chambers (abstract), thus leading to increased purity and control of deposition material for each chamber. In

Art Unit: 1795

addition, there is no claim limitation requiring the exhaust ports to be on different sidewalls; the claim requires only that the exhaust ports be on different sides of the partition, which Casey does teach.

6. On p. 8, the Applicant argues that claim 1 limitation of multiple exhaust ports are not mere duplication of parts since the result is a separation of the atmospheres between the first and second deposition areas without implementing a physical partition between the first and second film deposition areas.

The Examiner respectfully disagrees. The combination of Casey and Rauschnabel et al teaches a separation of atmospheres since each chamber is separated is separated by a partition and has individual vacuum pumps, resulting in a separation of atmospheres. In response to claim 1 requiring no implementation of partitions, claim 1 does not contain this limitation.

7. On p. 9, the Applicant argues that if an exhaust pump were to be supplied into chamber areas [47], [50] of Rauschnabel et al, the silicon monomer would be extracted immediately .

The Examiner respectfully disagrees. Whether or not the silicon monomer would be immediately extracted depends on the hypothetical location of the exhaust port in addition to the input pressure forcing the silicon monomer into the chamber areas [47], [50]. Furthermore, Applicant's figs. 1-2 depict a plasma generator [52] passing by exhaust port [83] en route to sputter source [35], leading one of ordinary skill to conclude that the plasma from said plasma generator [52] is immediately extracted by

Art Unit: 1795

said exhaust port [83] before reaching said sputter source [35] for the same reasoning and arguments provided above.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Nos. 4,824,545; 5,618,388.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Band whose telephone number is (571) 272-9815. The examiner can normally be reached on Mon-Fri, 8am-4pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

10. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Application/Control Number: 10/765,140

Page 10

Art Unit: 1795

/M. B./

Examiner, Art Unit 1795

/Rodney G. McDonald/

Primary Examiner, Art Unit 1795